



# LHC LOGGING

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## Outline



- Launching of the LHC Logging project
- Mandate, scope and objectives
- Timeline of the project, resources
- Context: where does logging fit in?
- Basic functionalities
- Filtering of data
- Interfacing to other systems
- The time issue
- Architectural design, use of technologies
- Conclusions



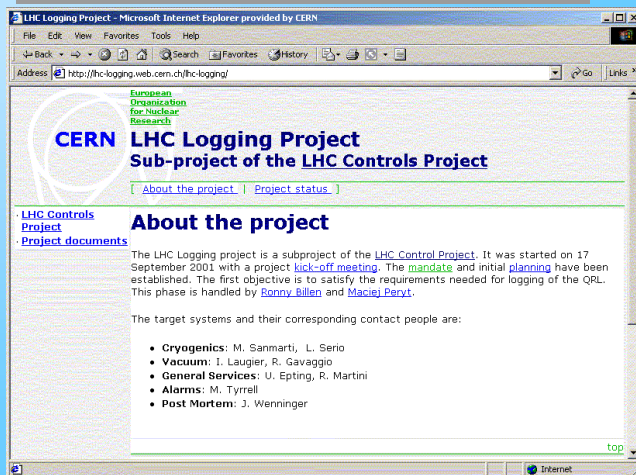
## Project launch



Started on 17-Sep-2001  
launched as sub-project of LHC-CP

R. Billen (SL)  
M. Peryt (LHC)  
initial resources

<http://lhc-logging.web.cern.ch/lhc-logging/>



## Mandate, scope, objectives



Analysis, design, procurement of Logging Facilities for future LHC Controls System

- Information management for LHC performance improvement
- Meet INB requirements for recording beam history
- Make available long term statistics for management
- Avoid duplicate logging efforts

Within the scope is:

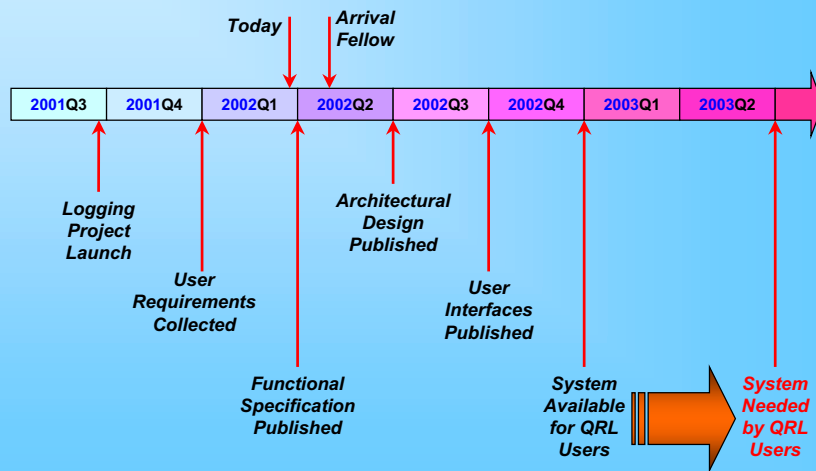
- Analyze experience, capture requirements
- Implement first version to support QRL controls
- Investigate interface with Alarms and Post-Mortem systems

Objectives

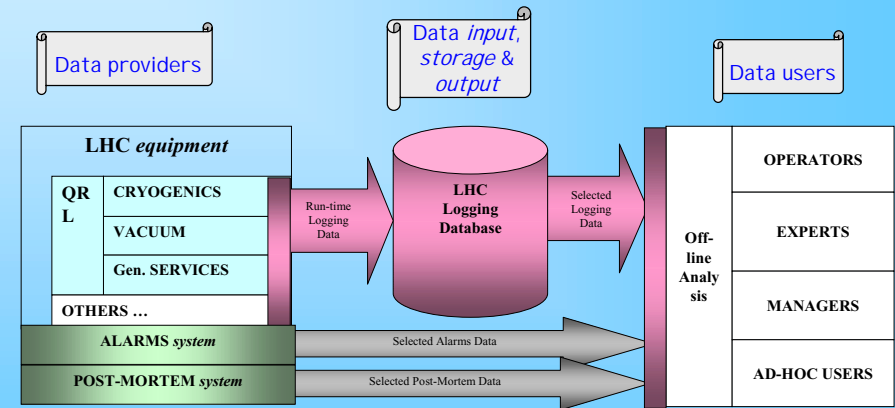
- Establish logging facility for QRL, scalable to LHC
- ~ Major project review after validation for QRL



## Project Timeline



## Logging Context



## Functionalities



Logging data = Time-Series data + Meta-data

*Time-Series* = 2D {Timestamp, Value}

*Meta-data* describes Time-Series

Data values of all *normal* types

Timestamps with *sub-second* precision possible

*Derived* time-series with formula or algorithm applied

Physical values from raw values

Aggregate information like subtotals, averages

Logged data remains *persistent*

Data output tool with *charting* and *filing* options

*User profile* data kept to store *preferences* for data visualization



## Data filtering



The final objective of the central logging facility in LHC *operational performance*

In discussion with the data provider, advice will be given with respect to appropriate *data input* filtering

Depending on system concerned

May imply summary data, averages, sampling,...

For *data output* filtering options will be foreseen as well



## Interfacing to other systems



Correlate **Alarms** data to logging data

- M Event type data
- M Start/End time of an alarm
- M Character string data
- N Well-defined naming schema to be respected

Combine **Post-Mortem** data to logging data

- M Only loosely coupled systems
- M High frequency data timestamp accuracy
- M Large volume data filtering
- N Well-defined naming schema to be respected

Data exchange with industrial systems (**SCADA**)

- Logging of their data standardized
- ? Visualizing logging data in PVSS trending tool why not?



## The TIME issue



The **data provider** will procure to the logging system **time-stamped** data, i.e. the Time-Series

The responsibility for the **correctness** of the time remains with the **data provider**

All data providers should have a **synchronized time-stamping facility**

The use of UTC, Local Time, Time-zone, Summer-time (till 2006 at least) **must** be defined at LHC-CP level

It will be difficult to correlate data with different time-stamp **accuracy** (and to indicate different accuracies)



## Architecture & Technology



The architectural design phase will start in a few weeks

Established Technologies will be used...

ORACLE



W3C

the XML



## Conclusions



The LHC Logging project is firmly launched

The systems involved in QRL are the first real clients

The Logging System must be scalable for LHC

Milestones have been respected so far

The architectural design phase is about to start

The extra 6 months are warmly welcomed for the implementation phase

That's all folks!

